

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/856,414	05/18/2001	Johann Engelhardt	21295/24	7891

29127 7590 08/06/2004

HOUSTON ELISEEVA
4 MILITIA DRIVE, SUITE 4
LEXINGTON, MA 02421

EXAMINER

CHANG, SUNRAY

ART UNIT	PAPER NUMBER
----------	--------------

2121

DATE MAILED: 08/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/856,414

Applicant(s)

ENGELHARDT ET AL.

Examiner

Sunray Chang

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☒ Claim(s) 1,2,5 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>20010518</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1 – 15 are presented for examination.

Claims 1 – 15 are rejected.

Claim Objections

2. **The claims 1 and 2 are objected to** because they include reference characters, which are not enclosed within parentheses.

Reference characters corresponding to elements recited in the detailed description of the drawings and used in conjunction with the recitation of the same element or group of elements in the claims should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. See MPEP § 608.01(m).

3. **Claims 5 and 7 are objected to** because of the following informalities: The terms **[and the]** and **[?is such that]** are not related with anything useful disclosure of the claims. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. As to claim 1 – 15, there is insufficient antecedent basis for this limitation in the claim. For example, applicants recite the limitation "the system parameters" (Line 1), "the following steps" (Line 3) and "the user" (Line 4) of claim 1, "the input" in first line of claim 2, are not previously cited.

Art Unit: 2121

5. As to dependent claim 2, applicants recite the limitation "the input" in first line of claim 2.

There is insufficient antecedent basis for this limitation in the claim. The "the input", in first line of claim 2, is not previously cited.

6. As to dependent claim 3, applicants recite the limitation "detection method" in first line of claim

3. There is insufficient antecedent basis for this limitation in the claim. The "detection method", in first line of claim 3, is not previously cited.

7. As to dependent claim 5, applicants recite the limitation "specimen property" in first line of

claim 5. There is insufficient antecedent basis for this limitation in the claim. The "specimen property", in first line of claim 5, is not previously cited.

8. As to dependent claim 6, applicants recite the limitation "setting a detection pinhole diameter"

in first line of claim 6. There is insufficient antecedent basis for this limitation in the claim. The "setting a detection pinhole diameter", in first line of claim 6, is not previously cited.

9. As to dependent claim 10, applicants recite the limitation "assistance or solutions" in first line of

claim 10. There is insufficient antecedent basis for this limitation in the claim. The "assistance or solutions", in first line of claim 10, is not previously cited.

10. Dependent claims which are not particularly rejected are rejected based on rejected base claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. **Claims 1 – 5, 7, 8 and 13 – 15** are rejected under 35 U.S.C. 102(b) as being anticipated by Christopher R. Fairley et al. (PCT/US95/00665, Appendix G, A Method And Apparatus For Performing An Automatic Focus Operation, June 3rd, 1994, And referred to as **Fairley** hereinafter).
12. Regarding independent claim 1, Fairley teaches a method for setting the system parameters of a confocal laser scanning microscope; [Page 309, Line 10 – 13]
 - creation of a user interface interactively with the user; [Page 319, Line 5]
 - input of at least one specimen parameter, at least one selectable system parameter by the user, at least one definable problem regarding image acquisition; [Page 309, Line 11 – 18]
 - proposal of other system parameters, optimization paths, and imaging strategies regarding image acquisition; [Page 309, Line 21 – 23]
 - selection of a proposal by the user; [Page 309, Line 14 – 16]
 - automatic setting of the system parameters of a selected system setting or imaging strategy. [Page 309, Line 10 – 11]
13. Regarding dependent claim 2, Fairley teaches the input of at least one of the following parameters determines the specimen dimension [specific type of wafer] to be imaged, the specimen region [specific type of wafer] to be imaged, the number of optical steps [process step], the specimen

Art Unit: 2121

property [specific type of wafer] to be imaged, and the detection method [number of slices of data].

[Page 309, Line 20 – 26]

14. Regarding dependent claim 3, Fairley teaches the detection method involves alternatively the use of a fluorescence method [Page 312, Line 20 – 21] and a reflection method [Page 312, Line 24].

15. Regarding dependent claim 4, Fairley teaches the proposal step [recipe] concerns the use of a suitable objective [properly specified recipe] having the highest possible numerical aperture [camera intensity, Page 326, Line 7]; the maximum resolution [laser scan x, y solution] achievable with the selected objective, [Page 325, Line 14 – Page 326, Line 18]

Fairley further teaches, the present resolution on the basis of specific and previously set system parameters [most of the optic parameters], are reported to the user [Page 325, Line 15 – 20]; and the number of pixels [number of slices] per image plane is proposed to the user [loaded into the LIS]. [Page 326, Line 6 – 12]

16. Regarding dependent claim 5, Fairley teaches the specimen property [sample thickness] to be determined serves to ascertain the optimum irradiation intensity [laser intensity]; optimum irradiation intensity [laser intensity] is proposed to the user [loaded into the LIS where the recipe is load]. [Page 326, Line 6 – 12]

17. Regarding dependent claim 7, Fairley teaches the interface upon selection of a creation of the user t least one system parameter all those system. parameters that are influenced by the selection are presented for the user, [Customize and automate many of the instruments function, Page 325, Line 14 – 15]

Fairley further teaches, the user is also informed as to how, on the basis of the selection of a system parameter, an image acquisition can be performed with the best possible quality. [each recipe's screen is given a descriptive name, Page 325, Line 27 – 28]

18. Regarding dependent claim 8, Fairley teaches at least one criterion that is important for the application can be defined for the optimization thereof [autofocus position to the ideal viewing position may also be preset, Page 25 – 26]; and that based on this definition, the further system parameters are interactively proposed and/or automatically set [the laser wavelength, and power, to be used maybe selected, Page 309, Line 22 – 23].

19. Regarding dependent claim 13, Fairley teaches the system parameters [scan parameters] are retrieved [setup], in consideration of the definitions, from an expert system stored in a database [By loading a properly specified recipe, the user can setup the LIS with the exact screen layout and scan parameters, as well as defect sort criteria, without any user input, Page 325, Line 15 - 20].

20. Regarding dependent claim 14, Fairley teaches the system parameters [scan parameters] are ascertained [exact], in consideration of the definitions, using fuzzy logic [if the recipe is found], and are set after selection or automatically [customize and automate]. [Page 325, Line 14 – 20]

21. Regarding dependent claim 15, Fairley teaches an activatable [automatic operation] and interfacing teaching program [pre-programmed] for optimal - preferably specimen-specific [specific type of wafer] and/or problem specific [laser wavelength, power] - system setting [slices of data, spacing] and/or imaging strategy [autofocus] [Page 309, Line 20 – 26].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

22. **Claims 6 and 9 – 12 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Fairley, and in view of Timothy V. Thompson (U.S. Patent No. 5,483,055, and referred to as Thompson hereinafter).

(Fairley as set forth above generally discloses the basic inventions.)

23. **Regarding Claim 6**, Fairley teaches setting a detection pinhole diameter, an optimized value at which the image acquisition resolution is maximal [pinhole whose diameter has been selected, Page 311, Line 16 - 17].

Fairley does not teach the image acquisition signal-to-noise ratio.

Art Unit: 2121

Thompson teaches an optimized value [idealized graph] at which the image acquisition resolution is maximal [full width half max measurement], while the image acquisition signal-to-noise ratio [301, 303, Fig. 3a] is still usable. [Col. 4, Line 20 – 29]

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Fairley to include "image acquisition signal-to-noise ratio" with the motivation being to provide for the purpose of performing an accurate, reliable, high-speed, auto-focus operation.

24. **Regarding Claim 9**, Fairley teaches predefined criterion [Page 309, Line 26].

Fairley does not teach the signal-to-noise ratio.

Thompson teaches signal-to-noise ratio [301, 303, Fig. 3a].

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Fairley to include "signal-to-noise ratio" with the motivation being to provide for the purpose of performing an accurate, reliable, high-speed, auto-focus operation.

25. **Regarding Claim 10**, Fairley teaches user interface [Page 319, Line 5].

Fairley does not teach assistance or solutions for predefined problem situations are offered by means of the user interface.

Thompson teaches assistance or solutions [second range of motion that is chosen] for predefined problem situations [move to the location at which the maximum absolute value of the electronic focus signal in the second range of motion was measured]. [Col. 2, Line 33 – 41]

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Fairley to include "assistance or solutions for predefined problem situations are offered by means of the user interface" with the motivation being to provide for the purpose of performing an accurate, reliable, high-speed, auto-focus operation.

26. **Regarding Claim 11**, Fairley teaches a method for setting the system parameters of a confocal laser scanning microscope; [Page 309, Line 10 – 13].

Fairley does not teach the following problems:

- "the specimen [in the case of fluorescence specimens] bleaches excessively"; and/or
- "the image data are noisy"; and/or
- "the measurement time is too long"; and/or
- "situations are "the resolution is too low."

Thompson teaches

- "the specimen [in the case of fluorescence specimens] bleaches excessively" [intensity, Col. 1, Line 34]; and/or
- "the image data are noisy" [contrast, Col. 1, Line 47]; and/or
- "the measurement time is too long" [slow, Col. 1, Line 46]; and/or
- "situations are "the resolution is too low." [accuracy, Col. 1, Line 56]

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Fairley to include "the specimen [in the case of fluorescence specimens] bleaches excessively"; and/or "the image data are noisy"; and/or "the measurement time is too long"; and/or "situations are "the resolution is too low." with the motivation being to provide for the purpose of performing an accurate, reliable, high-speed, auto-focus operation.

27. **Regarding Claim 12**, Fairley teaches a method for setting the system parameters of a confocal laser scanning microscope; [Page 309, Line 10 – 13].

Fairley does not teach mutually dependent system parameters are determined by means of an algorithm.

Thompson teaches mutually dependent system parameters are determined by means of an algorithm [because there is a certain amount of over shoot associated with stopping the relative motion between the target and the objective lens, several successive iterations can be performed to position the target closer to the focus position, Col. 2, Line 24 – 27].

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Fairley to include "mutually dependent system parameters are determined by means of an algorithm" with the motivation being to provide for the purpose of performing an accurate, reliable, high-speed, auto-focus operation.

Conclusion

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fairley et al. (U.S. Patent No. 5,672,861) discloses automatic focusing of a confocal laser microscope, intensive, focus position, aperture, contrast. Fairley et al. (U.S. Patent No. 5,783,814) discloses automatic focusing of a confocal laser microscope, intensive, focus position, aperture, contrast.


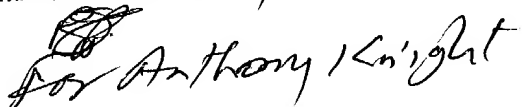
29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sunray Chang whose telephone number is 703-305-8744. The examiner can normally be reached on M-F 7:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on (703)308-3179. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-746-3506.

Sunray Chang
Patent Examiner
Group Art Unit 2121
Technology Center 2100
U.S. Patent and Trademark Office

July 28, 2004


RAMESH PATEL
PRIMARY EXAMINER 7/30/04

for Anthony Knight